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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3333
Plant ID No.:	049-00193
Applicant:	Perennial CMM West Virginia LLC
Facility Name:	Panther Lick Run
Location:	Marion County
NAICS Code:	333999
Application Type:	Construction
Received Date:	July 22, 2016
Engineer Assigned:	Dan Roberts
Fee Amount:	$1,000
Date Received:	July 25, 2016
Applicant Ad Date:	July 27, 2016
Newspaper:	*The Dominion Post*
Complete Date:	August 11, 2016
UTM Coordinates:	Easting: 570.430 km • Northing: 4,381.141 km • NAD83 Zone 17N
Lat/Lon Coordinates:	Latitude: 39.577089 • Longitude: -80.179942 • NAD83
Description:	Construction of a Perennial Energy Model CSF6-750 750 ft^3/minute (scfm) or 18 MMBtu/hr coal mine methane utility flare.

DESCRIPTION OF PROCESS

Perennial CMM West Virginia LLC (PCMMWV), a subsidiary of Perennial CMM, LLC, has submitted a permit application for the construction of a Perennial Energy Model CSF6-750 750 scfm or 18 MMBtu/hr coal mine methane 6" utility flare. An electrically driven centrifugal blower, powered by the local electrical utility, will provide the methane gas to the flare from a closed underground coal mine. Compressed nitrogen shall be used to operate a pneumatic safety shutdown valve on the flare. The proposed flare shall be equipped such that it closes the fuel shutdown valve and ceases venting to the atmosphere and sends an alarm notification if a flame is not present. The flare will be designed to operate 8,760 hours per year.

SITE INSPECTION

On September 21, 2016, Karl Dettinger and Kirk Powroznik of the DAQ's North Central Regional Office conducted an inspection of the proposed location for the Panther Lick Run utility flare. Notes from Mr. Dettinger regarding the inspection are as follows: "We arrived at the site at around 10:45 a.m., and met Colby Staggs, Chrys Fisher, and Larry Connor. The CBM well has already been drilled and cased. They have a methane "buster" on-site (although not connected to the well pipe). According to Mr. Connor, this machine, pulls vacuum on the well to see how much gas flow (scfm) can be expected, and what the composition of the gas is. The flare is not on-site yet. My opinion is that the site is acceptable. The nearest residence is approximately 150 -200 yds. from the site, but this is the residence of the owner of the property where the well is located. The site is approximately 80 yards from Panther Lick Run Road. Both of these distances were checked on Google Earth. I took 2 photos from the hill above the well site. The first shows Panther Lick Run Road in the distance down the hill (the road is behind the white Jeep). The second is looking toward the closest residence. If you look on Google Earth using the coordinates you gave in the earlier e-mail, you will see a building with a red roof (this is the residence in the photo)."

Directions from Charleston, WV are to take I77 North and travel 1.9 miles, keep right to take I19 North and travel 135.0 miles, take Exit 136 for WV-273 North towards Downtown Fairmont and travel 0.4 miles, turn left onto WV-273 and travel 0.8 miles, enter the roundabout and take the 2nd exit onto State St/WV-273 and travel 0.2 miles, enter the next roundabout and take the 2nd exit onto WV-273 and travel 0.2 miles, WV-273 becomes Jefferson St./County Highway 19/73 and travel 0.3 miles, turn right onto Adams St/US-19 N/US-250N and travel 0.1 miles, turn left onto Quincy St/US-19 N/US-250 N and continue to follow Quincy St/US-19 N for 0.1 miles, turn slight right onto Pennsylvania Ave/US-19 N and continue to follow US-19 N for 3.5 miles, turn left onto County Highway-17/County Road-17 and follow County Highway-17 for 4.9 miles to Grant Town. Just past Grant Town, turn right onto Panther Lick Run Road/County Route 28 and travel approximately 1.3 mile and the proposed site will be on the left.

AIR EMISSIONS AND CALCULATION METHODOLOGIES

PCMMWV included in Attachment N of the permit application an emission estimate for the proposed flaring of coal mine methane gas. Emissions of CO, NO_x, and VOCs were based on emission factors as given in AP-42 (AP-42 is a database of emission factors maintained by USEPA) Section 13.5. - "Industrial Flares." However, these emission factors are based on tests using crude propylene containing 80% propylene and 20% propane, not coal mine methane. Therefore, these emission factors may be conservative and overestimate the potential to discharge, specifically for VOCs, but they are the only ones available for a flare. Emissions of particulate matter and SO_2 are expected to be negligible.

Hourly emissions from the flare were based on the MDHI of the unit (18.00 MMBtu/hr). Annual emissions were based on operating 8,760 at MDHI. The following table details the calculated emissions from the proposed flare:

Table 1: Perennial Energy Model CSF6-750 Flare PTE

Pollutant	Emission Factor	Source	Hourly (lb/hr)	Annual (ton/yr)
CO	0.31 lb/MMBtu	AP-42, Table 13.5-2	5.58	24.44
NO_X	0.068 lb/MMBtu	AP-42, Table 13.5-1	1.22	5.36
VOCs	0.57 lb/MMBtu	AP-42, Table 13.5-2	10.26	44.94

REGULATORY APPLICABILITY

This section will address the potential regulatory applicability/non-applicability of substantive state and federal air quality rules relevant to the proposed Panther Lick Run utility flare.

45CSR6: To Prevent and Control Particulate Air Pollution from Combustion of Refuse

PCMMWV has proposed use of a flare for combusting coal mine methane to generate carbon credits. This flare will meet the definition of an "incinerator" under 45CSR6 and is, therefore, subject to the requirements therein. The substantive requirements applicable to the unit are discussed below.

45CSR6 Emission Standards for Incinerators - Section 4.1

Section 4.1 limits PM emissions from incinerators to a value determined by the following formula:

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions

Incinerator Capacity	Factor F
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

Based on the maximum capacity of the proposed flare of 750 scfm (45,000 ft^3/hour), and using the density of methane (0.0422 lb/scf), the capacity of the flare in lbs/hr would be approximately 1,900 lbs/hour (0.95 tons/hr). Using this value in the above equation produces a PM emission limit of 5.16 lb/hr. When operating correctly, there is expected to be only trace amounts of particulate matter from the flare and, therefore, the flare shall easily meet this limit.

45CSR6 Opacity Limits for - Section 4.3, 4.4

Pursuant to Section 4.3, and subject to the exemptions under 4.4, the flare has a 20% limit on opacity during operation. As a primary constituent in the vapors combusted in the unit will be

clean burning methane, particulate matter emissions from the unit is expected to be nominal. Therefore, the unit should easily meet this requirement.

45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The proposed Panther Lick Run utility flare will have a maximum emission rate of a regulated pollutant (VOCs) in excess of six (6) lbs/hour and ten (10) TPY (see Table 1 above) and, therefore, pursuant to §45-13-2.24, the facility is defined as a "stationary source" under 45CSR13. Pursuant to §45-13-5.1, "No person shall cause, suffer, allow or permit the construction . . . and operation of any stationary source to be commenced without . . . obtaining a permit to construct." Therefore, PCMMWV is required to obtain a permit under 45CSR13 for the construction and operation of the proposed Panther Lick Run utility flare.

As required under §45-13-8.3 ("Notice Level A"), PCMMWV placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is or will be located." The applicant published an ad on July 27, 2016 in *The Dominion Post* and the affidavit of publication for this legal advertisement was received on August 4, 2016.

45CSR14 (NON APPLICABILITY)

The facility-wide PTE of the proposed Panther Lick Run utility flare (see Table 1 above) will be below the levels that would define the source as "major" under 45CSR14 and, therefore, the construction evaluated herein is not subject to the provisions of 45CSR14.

45CSR30: Requirements for Operating Permits - (NON APPLICABILITY)

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The facility does not meet the definition of a "major source under § 112 of the Clean Air Act" as outlined under §45-30-2.26 and clarified (fugitive policy) under 45CSR30b. Therefore, the proposed Panther Lick Run utility flare is not subject to 45CSR30.

TOXICITY ANALYSIS OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the proposed Panther Lick Run utility flare and that are not classified as "criteria pollutants." Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM_{10}), Particulate Matter less than 2.5 microns ($PM_{2.5}$), and Sulfur Dioxide (SO_2). These pollutants (with the exception of PM) have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and

without national concentration standards, are regulated through various federal and programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) limits promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. The proposed Panther Lick Run utility flare will not produce any substantive amount of non-criteria regulated pollutants.

AIR QUALITY IMPACT ANALYSIS

The proposed construction does not meet the definition of a "major stationary source" pursuant to 45CSR14 and, therefore, an air quality impact (computer modeling) analysis is not required. Additionally, based on the nature of the construction , modeling was not required under 45CSR13, Section 7.

MONITORING, COMPLIANCE DEMONSTRATIONS, RECORD-KEEPING, AND REPORTING REQUIREMENTS

The following substantive monitoring, compliance demonstration, reporting, and record-keeping requirements (MRR) shall be required:

- To demonstrate compliance with flow and heat input limits given under 4.1.2(a) of the draft permit, the permittee shall be required to install instrumentation to monitor and record, at a minimum of fifteen (15) minute intervals, the flow of coal mine methane to the flare and BTU content of the coal mine methane sent to the flare;

- Flame compliance demonstration, monitoring and record-keeping is extensive and shall be required as given under 4.2.1(b) through (e) of the draft permit and may be reviewed there; and

- Recording and reporting for visible emissions testing shall be required as given under 4.4.4. and 4.5.1 of the draft permit and may be reviewed there.

PERFORMANCE TESTING OF OPERATIONS

The following substantive performance testing requirements shall be required:

- Visible emissions testing to show compliance with 45CSR6 shall be required initially within 180 days of start-up and thereafter at a minimum of at least once per each period of 12 months.

Additionally, a visible emission check shall be conducted each time the flare is manually started. Specific visible emissions testing requirements shall be as given under 4.3.1. of the draft permit and may be reviewed there.

RECOMMENDATION TO DIRECTOR

The information provided in permit application R13-3333 indicates that compliance with all applicable state and federal air quality regulations will be achieved. Therefore, I recommend to the Director the issuance of Permit Number R13-3333 to Perennial CMM West Virginia LLC for the construction and operation of the proposed Panther Lick Run facility to be located approximately 1.3 miles north of Grant Town on Panther Lick Run (County Route 28), Marion County, WV.

Daniel P. Roberts, Engineer Trainee
NSR Permitting Section

October 6, 2016
Date